sandstone, passes at times into cherty and jaspery and quartzitic facies. The same association of siliceous rock and iron ore is found near Pic River, near Rainy Lake and on Rainy River, and near Rat Portage. Jaspery material like that of Michipicoten is found interbedded with iron ores near Lakes Wahnapitae and Temagami, between Sudbury and the Ottawa River. "If, as seems probable, these jaspers are the equivalents of the western Huronian sandstones, we have a definite horizon, traceable from point to point across the whole northern end of the province" which will be "a most valuable thread with which to unravel the much disturbed and complicated series of Huronian in Ontario." The conglomerates frequently found near the iron-bearing series and containing sandstone, chert, or jasper, identical with those of the iron-bearing series, have a similar range from east to west across the province and are thought to mark the greatest break in the Huronian series, or, in other words, to form the basal conglomerate of the Upper Huronian.

The author shows that if these conclusions are well founded we have "a means of correlating the widely separated and very different looking rocks mapped as Huronian in Ontario. Applying these conclusions to the Shoal Lake district, a part of Lawson's Keewatin is of Huronian age. They may also lead to a more certain correlation of the pre-Cambrian rocks of Ontario and the Wisconsin-Minnesota region." R. D. GEORGE.

Mesozoic Fossils of the Yellowstone National Park. By T. W. STANTON. An extract from "Geology of the Yellowstone National Park," Monograph XXXII of the U. S. Geological Survey, Part II, Chapter XIII. Washington, 1899.

This chapter forms a valuable contribution to our knowledge of the Mesozoic faunas. The collection of invertebrate fossils described in it consists of seventy-eight species, having a distribution as follows: thirty-one are Cretaceous, forty-six are Jurassic, and one is possibly of Triassic age. The last specimen, a species of *Lingula* resembling *L. brevirostris* of Jurassic age, occurs in the Teton formation which occupies the stratigraphic position between the known Carboniferous and the undoubted Jurassic. This paleontologic evidence is considered too slight to form the basis of a correlation of the Teton with the Triassic of other areas.

The Jurassic assemblage forms the most important element of the collection. The two chief fossiliferous areas are: the one in the northwest corner of the Park, on the head waters of the Gardiner and Gallatin Rivers; and the other on the slopes of Sheridan Peak and farther southwest of Snake River. Two zones, characterized more by lithological than faunal peculiarities, are to be recognized, but the fossils belong to a single fauna.

The upper zone is marked by an arenaceous limestone yielding an abundance of *Rhynconella gnathophora*, *R. myrina*, *Ostrea strigilecula*, *Camptonectes bellistriatus*, and *C. pertenuistriatus*. The lower zone is characterized by calcareous clays and marls containing the majority of the above forms associated with *Pleuromya subcompressa*, *Pholadomya kingi*, and *Gryphea calceola* var. *nebrascensis*.

I found very similar zones in the Freeze-Out Hills of Wyoming, but they were characterized by slightly different assemblages of fossils. The upper zone consisted of clays and arenaceous limestones containing *Pentacrinus astericus* in abundance, and *Asterias dubium*, *Camptonectes bellistriatus*, *C.* (*extenuatus*) *pertenuistratus*, and *Ostrea strigilecula*. In the lower zone occurred clays and marls with calcareous nodules yielding *Astarte packardi*, *Pinna kingi*, *Pleuromya subcompressa*, *Pholadomya kingi*, and other forms. *Belemnites densus* and *Pentacrinus astericus* is common to both zones.

As these zones are both extremely narrow, are composed largely of clastic material, and contain an assemblage of fossils in many instances common to both, I think the conclusion that but a single fauna is represented is the correct one. This conclusion in regard to the Yellowstone region Dr. Stanton extends to the entire Jurassic formation of the Rocky Mountain region, and concludes as follows: "The stratigraphic relations and the geographic distribution of the marine Jurassic of the Rocky Mountain region are in favor of the idea that all of these deposits were made contemporaneously in a single sea."

A thin stratum of limestone in a position above the Jurassic beds and not far below the base of the Cretaceous section contains fresh water gastropods and Unios. The formation which contains this limestone is referred with considerable doubt to the Dakota. It is thought that it may be the equivalent of the Kootenai or Como. A similar limestone stratum occupying approximately the same stratigraphic position is found in the Como of Wind River, of the Black Hills, and the writer found it also in the Freeze-Out Hills. In all these localities

it contains a fresh water fauna consisting of gastropods and Unios, and in some instances species common to two or more localities.

The Colorado formation is represented by a characteristic fauna, consisting for the most part of Inocerami. The Montana formation is recognized, but its divisions are not easily differentiated. It seems probable that only the lower part of the Montana is represented.

In all, thirteen new species are figured and described. The majority of these belong to the Jurassic.

W. N. LOGAN.

The Glacial Gravels of Maine and their Associated Deposits. By GEORGE H. STONE. Monograph XXXIV, U. S. Geological Survey, 499 pp., 52 plates, 36 figures. Washington, 1899.

The enthusiastic pursuit of kames and eskers through the forests of Maine without official aid, in the later seventies, by Professor Stone, led to his engagement for a monographic study of all the glacial gravels of that phenomenally rich region by the U. S. Geological Survey. The results appear in this monograph. It would be an error, however, to overlook the second half of the title, for much attention is given to the formations associated with the glacial gravels, and tributary to their formation, so that the volume falls little short of being a monograph on the Pleistocene deposits of Maine.

So far as present knowledge extends, two regions surpass all others in the richness of their esker or osar phenomena — Maine on this continent, and Sweden on the eastern. This singular distribution is perhaps due to a critical relation between the general slope of the land surface in these regions and the minimum gradient at which glacier ice flows effectively, so that a condition of approximate stagnation was assumed in the closing stages of glaciation and the internal drainage lines of the ice sheet were permitted to develop with exceptional facility. However that may be, Maine is certain to be the classic field for esker studies in this country.

The plan of the volume embraces a preliminary discussion in which the fundamental facts of surface geology as illustrated in Maine are set forth with considerable fullness (chapters I, II, and III). The operative agencies are discussed in close connection with the phenomena described. This is followed by a general description of the systems of glacial gravels (chapters IV, and V). By systems is to be understood